Claims

What is claimed is:

1. A flat panel display arranged in a matrix of N rows and M columns comprising:

a first surface containing an anode thereon, said anode comprising:

a plurality of electrically conductive areas each associated with a row (N) and a column (M) defining a pixel location;

a phosphor layer associated with each of said pads;

a TFT circuit operable to apply a predetermined voltage to an associated area, said TFT circuit, comprising:

a first and second electrically cascaded devices each having at least one output and a first and a second input; and

a capacitor electrically connected between said output of said first device and second devices, ; and

a cold cathode having a surface facing said first surface, said cathode comprising:

an emitter material disposed on said cathode surface and operable to emit electrons when an associated threshold voltage is exceeded; and

a conducting layer disposed on said cathode surface and in contact with said emitter material.

2. The display as recited in claim 1, further comprising:

a grid interposed between said anode and said cathode.

3. The display as recited in claim 2 wherein a potential difference between said grid and said conducting layer exceeds said threshold voltage.

4. The display as recited in claim 1, wherein said cathode further comprises:

a second conductive layer electrically isolated from said emitter material.

5. The display as recited in claim 4, further comprising:

a first grid interposed between said anode and said cathode.

6. The display as recited in claim 5, wherein a potential applied to said first grid is less than a potential difference between said conductive layer and said second conductive layer, wherein said potential difference between said conductive layer and said second conductive layer exceeds said threshold voltage.

7. The display as recited in claim 5, further comprising:

a second grid interposed between said first grid and said anode.

8. The display as recited in claim 7, wherein said second grid potential is less than said first grid potential.

9. The display as recited in claim 2, further comprising:

a second grid interposed between said grid and said anode.

10. The display as recited in claim 7, wherein a potential applied to said second grid is less than said grid potential.

11. The display as recited in claim 1, further comprising:

a second surface having deposited thereon said cathode.

12. The display as recited in claim 1, wherein said first surface is optically transparent.

13. The display as recited in claim 1, wherein said conductive pads are optically transparent.

14. The display as recited in claim 11, wherein said second surface is optically transparent.

15. The display as recited in claim 11, wherein said second surface is selected from the group consisting of: silicon, poly-silicon, amorphous silicon.

16. The display as recited in claim 1, wherein said emitter material is distributed throughout said cathode, wherein electrons are emitted from an edge of said emitter material.

17. The display as recited in claim 1, wherein said emitter material is an alpha-carbon.

18. The display as recited in claim 1, wherein said emitter material is composed of a plurality of carbon nanotubes.

19. The display as recited in claim 1, wherein said conductive layer is substantially optically transparent.

20. The display as recited in claim 1, wherein said predetermined voltage is in the range of 20-30 volts.

21. The display as recited in claim 1, further comprising:

a plurality of insulating spacers electrically isolating said anode and said cathode.

22. The display as recited in claim 1, wherein a space between said first surface and said cathode is evacuated.

23. The display as recited in claim 1, wherein said phosphor layer material is operable to emit photons of a known wavelength.

24. The display as recited in claim 1, wherein said phosphor material is operable to emit photons selected from the group consisting of: red, green, blue.

25. The display as recited in claim 1, further comprising:

means to selectively apply a first potential to each of said N rows;

means to selectively apply a second potential to each of said M columns.

26. The display as recited in claim 1, wherein said first input of said first device is in electrical communication with one of said N rows, said second input of said first device in electrical communication with one of said M columns, said output of said second device in electrical communication with said associated area and said second device is adapted to receive said predetermined voltage on at least one of said inputs

27. A flat panel display comprising:

an anode arranged in a matrix of N rows and M columns comprising:

a plurality of electrically conductive areas;

a phosphor layer associated with each of said areas;

a TFT circuit operable to apply a predetermined voltage to an associated areas;

a first grid; and

a cold cathode facing said anode, said cold anode comprising:

an emitter material operable to emit electrons when an associated

threshold voltage is exceeded; and

a conducting layer underneath said emitter material.

28. The display as recited in claim 27, further comprising:

means to apply a potential to said first grid, wherein a potential difference between said first grid potential and a conducting layer potential exceeds said threshold voltage.

29. The display as recited in claim 27, wherein said cathode further comprises:

a second conductive layer electrically isolated from said emitter material.

30. The display as recited in claim 29, further comprising:

means to apply a potential to said second conductive layer, wherein a potential difference between said second conductive layer potential and the conducting layer potential exceeds said threshold voltage.

31. The display as recited in claim 30, wherein said first grid potential is less than said second conductive layer potential.

32. The display as recited in claim 27, further comprising:

a second grid positioned between said first grid and said anode.

33. The display as recited in claim 32, further comprising:

means to apply a potential to said second grid wherein said potential is less than said first grid potential.

34. The display as recited in claim 27, wherein said predetermined voltage is in the range of 20-30 volts.

35. The display as recited in claim 27, wherein said emitter material is distributed throughout said cathode.

36. The display as recited in claim 27, wherein said emitter material is composed of a plurality of carbon nanotubes.

37. The display as recited in claim 27, wherein said emitter material is an alpha-carbon having an edge.

38. The display as recited in claim 27, further comprising:

means to selectively apply a first potential to each of said N rows; and

means to selectively apply a second potential to each of said M columns.

39. The display as recited in claim 27, wherein said anode is deposited on an optically transparent surface.

40. The display as recited in claim 27, wherein said cathode is deposited on an optically transparent surface.

41. The display as recited in claim 27, wherein said cathode is positioned between said anode and an optically transparent surface.

42. The display as recited in claim 27, wherein said conductive layer is a filament.

43. A flat panel display having an anode and a cathode, said display arranged in a matrix of N rows and M columns, wherein the intersection of a row and column constitutes a pixel, in combination therewith the improvement comprising:

a cold cathode for emitting electrons to be directed to said anode,

and a TFT circuit for each pixel, said circuit employing first and second active devices in cascade and each coupled between an associated row (N) and column (M) to define a pixel at said location M and N and when activated operative to attract said emitted electrons to said pixel location.